

 Eskom	SOW	Camden Power Station
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Title: **Raw Water Make-up to CW Forebay Refurbishment** Document Identifier: **240-162239785**

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Functional Area: **Maintenance**

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1. Introduction

The butterfly isolation valves and float valves on the Raw Water make-up lines to the East and West Forebay are passing and need to be repaired/replaced. Furthermore the supply line between the isolation valve and the float valve is damaged and needs to be replaced.

N.B. The isolation points further upstream are also suspected to be passing and the Contractor will be expected to work in an environment where the complete isolation of the Raw Water make-up may not be possible. The appointed Contractor is expected to provide all equipment necessary for the repair/replacement including lifting equipment.

2. Supporting Clauses

2.1 Scope

2.1.1 Purpose

Refurbishment of the Raw Water isolation and float valves and replacement of the damaged section of the supply line on both the East and West forebays.

Raw Water Line Design Information:

- Medium: Raw Water
- Raw Water Quality:
 - pH - 7 - 11.5
 - K₂₅ - 500
 - Na - 50ppm
 - SiO₂ - 20ppm
 - Mg - 20 - 100ppm
 - Cl - 20 - 100ppm
 - SO₄ - 100 - 400ppm
- Material: Carbon Steel A106B
- Pipe Schedule: Schedule 40
- Nominal Bore: 24"
- Temperature: -10°C to 40°C
- NDE Requirements: As per construction code BS 13480
- Welding requirements: As per construction code BS 13480

2.1.2 Applicability

- Auxiliary Plant Engineering
- Auxiliary Plant Maintenance
- Operations

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2.1.3 Effective date

See date of authorized signature

2.1.4 Normative References

- 240-101712128 - Standard for the Internal Corrosion Protection of Water Systems, Chemical Tanks and Vessels and Associated Piping with linings
- 240-106628253 - Standard for Welding Requirements on Eskom Plant
- 240- 105020315 - Eskom Standard for Low Pressure Valves
- 240- 83539994 - Standard for Non-Destructive Testing (NDT) on Eskom Plant
- 240- 56364545 - Structural Design and Engineering Standard
- ISO 12944 - Paints and Varnishes - Corrosion Protection of Steel
- ISO 146 - Hot Dip Galvanized Coatings on Fabricated Iron and Steel Articles
- EN 13480 - Metallic Industrial Piping
- OHSA - Occupational Health and Safety Act South Africa No 85 and amendments

2.1.5 Informative References

- N/A

2.2 Definitions

N/A

2.3 Abbreviations

BS	British Standard
CW	Cooling Water
NB	Nominal Bore
QCP	Quality Control Plan
SOW	Scope of Work

2.4 Process for Monitoring

N/A

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2.5 Related/Supporting Documents

N/A

3. Scope of Work

The following scope of work for the Raw Water Make-up to CW Forebays repairs will include the refurbishment of the Raw Water isolation and float valves and replacement of the damaged section of the make-up line on both the East and West Forebays.

NB. Should the isolation and float valves be found to be damaged beyond repair or damaged beyond repair during the refurbishment process then the Contractor will be responsible for replacing the valves with a like for like specification. The Contractor will submit the specification of the proposed replacement valve to Eskom for approval prior to purchasing or installation.

3.1 Pre-Preparation:

- Ensure that a risk assessment is compiled with all relevant stakeholders present.
- Contractor to ensure all equipment required to isolate and rig out the valves and pipeline is available and on site
- Contractor to supply new rubber gaskets, bolts and nuts
- The Contractor will be expected to supply one spare float valve inclusive of drawings and casting mould
- All material required for the refurbishment and replacement should be procured from approved Eskom suppliers and delivered to site prior to commencement of the task
- All material used should be corrosion resistant and suitable for the water quality stipulated above
- Material Data Sheet and 3.1 cert to be supplied to the Client prior to execution
- Contractor to walk the plant and supply an as-built drawing of the existing plant for approval by the Client and the Welding Administrator
- The as-built drawing should include clear labels indicating all welds
- A bill of material must accompany the as-built drawing
- Once a detailed repair SOW is concluded, the Contractor must supply necessary QCP and Welding Procedures for approval prior to commencement
- It should be noted that it may not be possible to execute the SOW on all the valves and damaged pipe sections simultaneously as this will depend on the current status of the station at the time of execution. The Client will advise further

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3.2 Refurbishment of valves (Adhere to Eskom standard 240-105020315):

- Isolate the Raw Water supply to the relevant side i.e. valve 00 GAC41 AA501 or 02 GAC10 AA501.
- Remove and refurbish the following valves:
Butterfly Valves:
 - 01GAC10AA501
 - 01GAC10AA502
 - 02GAC10AA502
 - 02GAC10AA503Float valves:
 - 01GAC10AA601
 - 01GAC10AA602
 - 02GAC10AA601
 - 02GAC10AA602
- **NB.** The valves may be sent away for full refurbishment. Once the valves are removed from position, an Eskom engineer and the Contractor will have to first inspect, discuss and agree on the repair/refurbishment scope before the valves are removed from site.
- Remove the valves from installation location
- Disassemble the valves
- Clean all components for the Engineer and Contractor's inspection, sandblast to approved specification for inspection and coating
- Replace defective components in accordance to the inspection findings, approval from site Engineer required
- Arrange for corrosion protection of the valve internal and external (done by valve repairer) as per 240-101712128 - Standard for the Internal Corrosion Protection of Water Systems, Chemical Tanks and Vessels and Associated Piping with linings
- Assemble the valve
- Carry out a seat leakage test (BS EN 12266-1, Rate A)
- All gaskets and o-rings to be selected by repair to prevent system leakages
- Install the valves
- Commission valve and check for leaks
- Refurbish the gearbox on the butterfly valves and functional test

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3.3 Replacement of Pipeline:

3.3.1 Pipe and Fittings Specifications

3.3.1.1 Raw Water Pipe Specification:

- All pipework shall conform to ASTM A106
- Material: Carbon Steel, Grade B Seamless Pipe
- Schedule 40
- Size : 24 inch

NB. All specifications to be confirmed by the Contractor prior to execution

3.3.1.2 Flange Specifications:

- All flanges shall conform to BS 10 : Table E
- All flange sizes: 24 inch
- Flange Type: Forged Weld Neck Raised Face
- Material: Carbon Steel with 3.1 certification
- Bolts and Nuts: As per table, High Tensile Strength 8.8

3.3.1.3 Bends Specifications:

- All pipe shall conform to ASTM A106
- Material: Carbon Steel, Grade B Seamless Pipe
- Schedule 40
- Nominal Bore: 24 inch (Quantity to be verified)
- Material Data sheet and 3.1 cert to be supplied

3.3.1.4 Gasket Specifications:

- 3mm Klinger type C4430

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3.3.2 Installation

- The Raw Water make-up line between the butterfly isolation valve and the float valve is not easily accessible as it passes through a concrete wall. Hence replacement of the damaged section of this line will require the Contractor to cut through the concrete.
- Once the valves are removed, remove damaged section of existing Raw Water make-up line with the aid of a crane
- Install new pipe section including all fittings (with like for like material)
- Weld flanges on new pipe sections
- All welding will be in line with the requirements of the Eskom welding requirements document 240-106628253 Standard for Welding Requirements on Eskom Plant
- All preps must be NDT as per Welding Procedure. **NB.** NDT's to be conducted by an Eskom approved NDT company
- All fit-up inspections must be conducted by Welding Inspector
- All final welds must be NDT as per 240-83539994 Standard for Non-Destructive Testing (NDT) on Eskom Plant
- All pipes must be painted externally. A red oxide base coat must be applied first and matching enamel coat must be applied thereafter
- Apply a corrosive resistant internal coating as per Eskom specification (see 2.1.4) **NB.** Only approved coating suppliers to be used
- Install gaskets and flange pipe sections together by fastening nuts and bolts
- Install valve where applicable
- QC to inspect the new section of pipe once coupled together to ensure all bolts and nuts are fastened
- The new pipe sections to be connected into the existing Raw Water Make-up System
- Leak test line to identify leaks

4. Acceptance

N/A

5. Revisions

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6. Development Team

7. Acknowledgements

N/A

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